

Remarks:

Claims 85-101 are presently pending in the application. The instant application is a divisional application of Applicant's U.S. Application Serial Number 09/565,138, filed 05 May 2000 (now U.S. Patent No. 6,723,428), and the subject matter of instant claims 85-101 correspond to claims 37-47, 62, 65-66, 54-55, and 72-74 of the '138 application that were not elected for prosecution in that application in response to a restriction requirement in the parent application. A preliminary amendment was filed 20 February 2004 in the instant application to include limitations reciting numerical percentage ranges that were allowed in the parent '138 application.

Claim Objections

Claims 93 and 94 were objected to for reciting an acronym, PETG, which it is asserted did not adequately define the polyester material. Claim 93 has been amended to more clearly define PETG to mean a glycol-modified polyethylene terephthalate polymer. Claim 94 depends from claim 93, which defines the acronym, so no amendment of claim 94 is believed necessary to remove this ground of objection for both claims.

Double Patenting Provisional Claim Rejections

Claims 87-101 were provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over selected claims of co-pending application numbers 10/765,255, 10/762,920, 10/765,414, 10/768,840 and 10/406,720, each of which is commonly owned by the assignee of the instant application. A terminal disclaimer and associated fee accompany this paper which disclaims the term of any patent granted based upon the instant application beyond the expiration of the term of any patent which issues based upon the referenced applications. Thus, it is respectfully submitted that these grounds of provisional rejections have been obviated.

Claim Rejections under 35 USC §112

Claim 93 was rejected as reciting a limitation "the carrier for color pigments" that had insufficient antecedent basis. The claim has been amended to replace article "the" with "a" to comport with accepted protocols for antecedent basis usage. In this light, Applicant respectfully requests reconsideration and withdrawal of this ground for rejection.

Claim Rejections under 35 USC §102

Claims 85, 86, 88, 89, 92 and 95-101 were rejected under 35 USC §102(b) as being anticipated by Ando¹. The Action asserts that the limitation "*the thickness of the sheath in microns being approximately two times the nominal particle size in microns of the additive*" is taught by Ando's use of "fine particles" of several microns to hundreds of microns in size in the fiber.

Applicant respectfully disagrees. Rather than focusing, as Ando does, upon a zeolite particle surface area requirement (*i.e.*, at least 150 m²/g; col. 4, ll. 44-47) to obtain an efficacious antimicrobial fiber, Applicant has recognized that the claimed geometric relationship between the antimicrobial particle size and the thickness of the sheath produces the desired antimicrobial effect while minimizing the quantity of antimicrobial particles needed. Nowhere in Ando is such a dimensional relationship described or even suggested. A reader is left with an potentially limitless number of possibilities

Ando describes a process by which conjugate fibers are spun and then heated so that the "low-melting component melts and spreads to increase its surface area." (col. 8, ll. 30-33) Such a spreading is apparently necessary as the spinning process appears not to guarantee a uniform sheath thickness or particular relative geometry among the core, sheath and particles. Applicant's fiber co-extrusion process, in contrast, controls these dimensions to achieve the claimed relative geometry, thereby ensuring the desired antimicrobial effect with minimal particle requirement.

Claim Rejections under 35 USC 103(a)

(a) Claims 85-89 and 95-101 were rejected under 35 USC 103(a) as being unpatentable over Morrison² in view of Ando. The Action reiterates the assertion that Ando teaches most of the

¹ US Patent No. 5,064,599 issued 12 November 1991 to Ando, *et al.*

² US Patent No. 3,959,556 issued 25 May 1976 to Morrison, Willard L.

limitations of the claimed invention, and utilizes Morrison for its teaching of a fabric comprising a blend of thermoplastic fibers comprising at least 0.1 percent by weight of an anti-microbial agent and natural fibers such as cotton, and its recitation of several polymers with melting points below 200 degrees C.

Applicant respectfully restates that Ando fails to teach the claimed invention, including the limitation relating the particle size to the sheath thickness needed to maintain antimicrobial effect with limited particle usage, and that Morrison does not cure the omitted teachings or suggestion of such a limitation. Morrison's blend does not comprise a sheath/core configuration. Rather, Morrison discloses a fiber blend formation process wherein a mixture of thermoplastic resin and antimicrobial agents is heated to a temperature above that of both the resin and the agent in order to provide a surface coating of antimicrobial agent to the fiber, followed by an "intimate admixing by twisting" naturally occurring fibers with the antimicrobial fibers. This fiber formation process similarly fails to obtain the geometric relationship recited in claims 85-86 between the antimicrobial particle size and the sheath thickness.

Further, with regard to claim 87, unlike Morrison's blend, which establishes an intimate contact through twisting, the presently claimed fabric results from a heating of a blend of anti-microbial free fibers and antimicrobial fibers. After heat activation, the anti-microbial additives are continuously released to wet the surface of the surrounding non anti-microbial fibers with the anti-microbial additives. Neither Morrison nor Ando, alone or in combination, teach or suggest a fabric recited in claim 87. Rather, they rely on mechanical crimp-like blending of the fibers. Thus, independent claim 87, and the claims that depend therefrom, are nonobvious in light of the cited art.

(b) Claims 85, 86, 88, 92 and 95-101 were rejected under 35 USC § 103(a) as being unpatentable over Hartzog³ in view of Rock. The Action states that Hartzog teaches in Table 3 that the sheath takes up about 20% to about 50% of the fiber. Respectfully, this is not correct since this range includes matter which Hartzog clearly states is outside of his desired range.

For example, see column 3, in the Summary of the Invention where it is stated that the sheath comprises less than thirty percent of the total cross-sectional area of the fiber. This is

³ US Patent No. 6,037,057 issued 14 March 2000 to Hartzog, *et al.*

repeated at the end of column 3 in the beginning of the detailed description. At the top of column 4, Hartzog states that it is desirable to have the sheath comprise as little of the cross-sectional area as possible.

Contrary to the assertion in the Action, Table 3 does not teach to make fiber sheaths of over 30% of the total fiber cross-section. This table is only showing the results of the experiments which Herzog carried out to show that they obtained acceptable (to them) results only when the sheath was less than 30% of the fiber cross section. See FIG. 2 in which all of the examples from Table 3 are shown, and only Example 1, and possibly Example 2, are considered acceptable to them. Examples 1 and 2 have 20% and 30%, respectively, of the sheath area compared to the total fiber cross section.

FIG. 6 does not provide any information, by itself, about the sheath thickness. At the top of column 13 Hartzog indicates that the range of sheath cross section was from 20% to 50%. FIG. 6 only shows the distance in microns that the antimicrobial was located from the surface of the sheath but does not show the thickness of the sheath. Furthermore, claims 85-86 have been amended to include the limitation "zeolitic." Hartzog actually teaches away from the use of zeolites in its Background of the Invention, column 2, lines 17-59. Therefore, Applicant respectfully requests reconsideration and withdrawal of this ground for rejection.

(c) Claims 90-92 were rejected under 35 USC 103(a) as being unpatentable over Ando in view of Heiman⁴. Heiman is cited for its teaching of a diaper comprising an absorbent pad and wicking layer, however Heiman similarly fails to supplement the disclosures missing from Ando of (a) the geometric relationship between the antimicrobial particle size and (co-extruded) sheath in a core/sheath fiber based fabric, and (b) a fabric blend of naturally occurring or other antimicrobial-free fibers wetted by melting with antimicrobial fibers. In this light, the combination of Ando and Heiman fails to teach or suggest the independent claims from which claims 90-92 depend, and thus it is respectfully submitted that claims 90-92 are similarly patentable over the cited art.

(d) Claims 93-94 were rejected under 35 USC 103(a) as being unpatentable over Ando in

⁴ US Patent No. 5,290,269 issued 01 March 1994 to Heiman, Mark J.

view of Haile⁵. The Action asserts that Ando only fails to teach a sheath comprising a pigment and PETG, and that Haile teaches forming various polyester based bi-component fibers comprising a core of PET and sheath of PETG, but recognizes that Haile fails to teach using the PETG sheath as a carrier for the pigment.

As in (c) above, Haile fails to supplement the disclosure of the limitations recited in claims 85 and 86 as discussed above. For the same reason, thus, claims 93-94 are similarly patentable over the cited art.

(e) Claims 93-94 were rejected under 35 USC 103(a) as being unpatentable over Hartzog in view of Rock and further in view of Haile.

The comments of section (b) with respect to the insufficiency of the combined disclosures of Hartzog and Rock are incorporated herein by reference. Haile does not disclose the core/sheath ratios of the presently claimed invention, and therefore fails to overcome the deficiencies of the aforementioned references.


In light of at least the foregoing, Applicant respectfully requests reconsideration and withdrawal of all grounds of rejection. The application stands in a condition for allowance, and a notice to such effect is earnestly solicited.

No new matter has been entered by these amendments.

Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 617-854-4000.

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⁵ US Patent No. 6,495,656 issued 17 December 2002 to Haile, *et al.*